

Meacham
U.S. Serial No. 10/802,476
Page 2 of 8

Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claim 1 (currently amended): A metallic barrier separating oxygen containing gas and hydrogen containing gas, comprising:

one or more fluidly connected pores leading from an interior of the barrier to one or more barrier surfaces,

wherein at least a portion of the metallic barrier comprises a noble metal.

Claim 2 (original): The metallic barrier of claim 1, wherein the barrier surfaces are contacted by the hydrogen containing gas.

Claim 3 (original): The metallic barrier of claim 1, wherein the barrier surfaces are contacted by the oxygen containing gas.

Claim 4 (currently amended): The metallic barrier of claim 1, wherein

at least a first portion of the fluidly connected pores is connected to the barrier surfaces contacted by the oxygen containing gas, and

at least a second portion of the fluidly connected pores is connected to the barrier surfaces contacted by the hydrogen containing gas.

Claim 5 (currently amended): The metallic barrier of claim 1, wherein the fluidly connected pores extend from the barrier surfaces contacted by the oxygen containing gas to the barrier surfaces contacted by the hydrogen containing gas.

Claim 6 (canceled)

Meacham
U.S. Serial No. 10/802,476
Page 3 of 8

Claim 7 (currently amended): The metallic barrier of claim 1, wherein ~~the barrier surfaces~~ contacted by the oxygen containing gas comprise a noble metal.

Claim 8 (currently amended): The metallic barrier of claim 1, wherein ~~the barrier surfaces~~ contacted by the hydrogen containing gas comprise copper or nickel.

Claim 9 (original): The metallic barrier of claim 1, wherein the metallic barrier comprises ceramic particles selected from the group consisting of: alumina, zirconia, and lanthanum chromite.

Claim 10 (original): The metallic barrier of claim 1, wherein the metallic barrier comprises metal oxide particles including at least one metal selected from the group consisting of: copper, nickel, palladium, platinum, rhodium, iridium, iron, and ruthenium.

Claim 11 (original): The metallic barrier of claim 1, wherein the metallic barrier comprises copper or nickel, and further comprises particles selected from the group consisting of: alumina, zirconia, and lanthanum chromite.

Claim 12 (currently amended): A method of separating gas A from gas B with a barrier, comprising the steps of:

providing the barrier made of a barrier material including at least a noble metal, such that the gases A and B are both soluble in and diffuse through the barrier material,

forming a product gas C by reacting the gases A and B with each other within the barrier material, the product gas C being substantially insoluble in the barrier material; and

venting the product gas C through a plurality of pores leading from an interior in of the barrier material to one or more barrier surfaces, so as to limit the pressure of the product gas C within the barrier material.

Claim 13 (original): The method of claim 12, wherein the gas A contains oxygen, the gas B contains hydrogen, and the product gas C comprises steam.

Mencham
U.S. Serial No. 10/802,476
Page 4 of 8

Claim 14 (original): The method of claim 12, wherein the barrier material is inert relative to the gases A and B and the product gas C.

Claim 15 (original): The method of claim 14, wherein the composition of the barrier material varies according to position within the barrier such that the gases A, B and the product gas C only contact material inert to the gases A, B and the product gas C respectively.

Claim 16 (original): The method of claim 14, wherein at least a portion of the barrier material is an electronically conductive metal.

Claim 17 (original): The method of claim 16, wherein at least a portion of the electronically conductive metal is a noble metal.

Claim 18 (original): The method of claim 14, wherein at least a portion of the barrier material is an oxide, ceramic or glass.

Claim 19 (currently amended): The method of claim 12, wherein the absolute pressure of the product gas C in one of the ~~connected~~ plurality of pores is higher than the absolute pressure of the gas A or the product gas C at a pore opening, such that outward flow of the product gas C prevents entry of the gas A or the product gas C.

Claim 20 (currently amended): The method of claim 12, wherein the absolute pressure of the product gas C in one or more of the ~~connected~~ plurality of pores is below a level that causes structural damage to the barrier material.

Claim 21 (currently amended): A solid oxide fuel cell, comprising:
a barrier having a first face, a second face, and a plurality of pores leading from an interior of the barrier to the first or second faces, wherein at least a portion of the barrier comprises a noble metal;

Meacham
U.S. Serial No. 10/802,476
Page 5 of 8

an oxygen-containing gas contacting the first face of the barrier; and
a hydrogen-containing gas contacting the second face of the barrier;
wherein the oxygen-containing gas and the hydrogen-containing gas diffuse into the
barrier and react to form a mixture of steam, the mixture being vented through the pores to the
first or second faces.

Claim 22 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to the
first face of the barrier.

Claim 23 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to the
second face of the barrier.

Claim 24 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to
both the first and second faces of the barrier.

Claim 25 (canceled)